

CLAIMS

1. A stabilized solid or liquid enzyme formulation comprising at least one phosphatase and at least one stabilizing agent selected from the group consisting of agar, algin, carrageenan, furcelleran, ghatti gum, tragacanth gum, gum karya, guaran, locust bean gum (= carob bean gum), tamarind seed gum, arabinogalactan, xanthan (gum), at least one animal protein and mixtures thereof, with the proviso that if gelatine is used in granules as solid formulations as the only stabilizing agent, the granules are subsequently coated.
2. Enzyme formulation according to claim 1, wherein the phosphatase is a phytase.
3. Enzyme formulation according to any preceding claim, wherein the phytase is a plant phytase, a fungal phytase, a bacterial phytase, a phytase producible by a yeast or a consensus phytase.
4. Enzyme formulation according to any preceding claim, wherein the animal protein is selected from the group consisting of proteins from poultry, beef, pig, fish and mixtures thereof.
5. Enzyme formulation according to any preceding claim, wherein the animal protein is selected from the group consisting of gelatine, casein, albumin and mixtures thereof.
6. Enzyme formulation according to any claim 1 to 5 characterized in that the formulation is liquid.
7. Enzyme formulation according to any claim 1 to 5, characterized in that the formulation is solid.
8. Enzyme formulation according to claim 7, characterized in that the solid formulation is in the form of granule(s).
9. Enzyme formulation according to claim 8, wherein the granule(s) comprise at least one phosphatase, a solid carrier which comprises at least 15% (w/w) of an edible carbohydrate polymer, and at least one stabilizing agent, wherein the stabilizing agent is selected from the group consisting agar, algin, carrageenan, furcelleran, ghatti gum, tragacanth gum, gum karya, guaran, locust bean gum (= carob bean gum), tamarind seed gum, arabinogalactan, xanthan (gum), at least one animal protein and mixtures thereof, with the proviso that if gelatine is used as the only stabilizing agent, the granules are subsequently coated.

10. Enzyme formulation according to claim 9, wherein the granule(s) is coated.
11. A process for the preparation of phosphatase-containing granule(s), the process comprising processing
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- (i) at least one phosphatase,
- (ii) a solid carrier which comprises at least 15% (w/w) of an edible carbohydrate polymer, and
- 10 (iii) at least one stabilizing agent, wherein the stabilizing agent is selected from the group consisting of agar, algin, carrageenan, furcelleran, ghatti gum, tragacanth gum, gum karya, guaran, locust bean gum (= carob bean gum), tamarind seed gum, arabinogalactan, xanthan (gum), at least one animal protein and mixtures thereof, with the proviso that if gelatine is used as the only stabilizing agent, the granules are subsequently coated.
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12. A process according to claim 11 wherein water is added to the processing.
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13. A process according to any claim 11 to 12 wherein the water and phosphatase are provided as enzyme-containing aqueous liquid(s).
14. A process according to claim 13 wherein the liquid is a filtrate derived from a fermentation process resulting in production of the phosphatase.
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15. A process according to any claim 11 to 14 wherein the granules are dried subsequent to the processing.
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16. A process according to any claim 11 to 15 wherein the animal protein is selected from the group consisting of proteins from poultry, beef, pig, fish and mixtures thereof.
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17. A process according to any claim 11 to 16 wherein the animal protein is selected from the group consisting of gelatine, casein, albumin and mixtures thereof.
18. A process according to any claim 11 to 17 wherein the process comprises:
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- a) mixing an aqueous liquid containing the enzyme with the solid carrier and the stabilizing agent;
- b) mechanically processing the mixture obtained in a) to obtain enzyme-containing granules; and

c) drying the enzyme-containing granule(s) obtained in b).

5 19. A process according to any claim 11 to 18 wherein the processing is mechanical and comprises extrusion, pelleting, high-shear granulation, expansion, fluid bed agglomeration, spheronisation, drum granulation or a combination thereof.

10 20. A process according to any claim 11 to 19 wherein enzyme-containing aqueous liquid, the solid carrier and the stabilizing agent are mixed and the resulting mixture is kneaded before granulation.

21. A process according to any claim 11 to 20 wherein the processing is extrusion performed at low pressure and/or in a basket- or dome- extruder.

15 22. A process according to any claim 11 to 21 wherein the granule(s) are spheronised.

23. A process according to any claim 11 to 22 wherein the granule(s) are coated.

20 24. A process according to any claim 11 to 23 wherein the phosphatase is a phytase, preferably a plant phytase, a fungal phytase, a bacterial phytase, a phytase producible by a yeast or a consensus phytase.

25 25. A process according to any claim 11 to 24, wherein the granule(s) will have phytase activity ranging from 1,000 to 80,000 FTU/g, preferably from 2,000 to 70,000 FTU/g, preferably 3,000 to 60,000 FTU/g, more preferably 4,000 to 50,000 FTU/g and more preferably from 5,000 to 15,000 FTU/g.

30 26. Enzyme-containing granule(s) obtainable by a process as defined in any claim 11 to 25.

35 27. A process for the preparation of an animal feed, or a premix or precursor to an animal feed, the process comprising mixing a stabilized solid and/or liquid formulation according to any claim 1 to 10 and/or claim 26 with one or more animal feed substance(s) or ingredient(s).

40 28. A process for the preparation of a composition, or a premix or a precursor suitable for human nutrition, the process comprising mixing a stabilized solid and/or liquid formulation according to any claim 1 to 10 and/or claim 26 with one or more food substance(s) or ingredient(s).

29. A process according to any claim 27 to 28 wherein the mixture of feed or food substance(s) and stabilized solid and/or liquid formulation according to any

claim 1 to 10 and/or claim 26 is sterilised or treated with steam, pelletised and optionally dried.

5 30. Use of stabilized solid and/or liquid formulation according to any claim 1 to 10 and/or claim 26 for human and/or animal nutrition.

10 31. A process for promoting the growth of an animal and/or improving the feed conversion rate, the process comprising feeding an animal with a diet that comprises stabilized solid and/or liquid formulation according to any claim 1 to 10 and/or claim 26.